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*Virginia.*—Five hundred and sixty cases of influenza were reported in the State during the week. During the preceding week 200 cases were reported.

*Washington.*—A sharp increase in the number of cases of influenza was reported.

*West Virginia.*—A recrudescence of the disease was noted in Charleston, South Charleston, Bluefield, and Clarksburg. Conditions were said to be as bad as ever in Wheeling.

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### SAFE MILK FOR THE SMALL TOWN.<sup>1</sup>

By K. E. MILLER, Passed Assistant Surgeon, United States Public Health Service.

In cities and larger towns no fundamental difficulties are now met with in furnishing bacteriologically clean milk. But, for economic reasons, the advances made in recent years in this field have not been extended to small towns. In such places the amount of milk consumed has been entirely too small to justify the overhead expense necessary for the employment of the usual methods of sanitary control on the part of either the town or the milk producer.<sup>2</sup>

There are two well-known methods of obtaining a safe milk supply: (1) Sanitary control of the production and distribution of the milk and (2) pasteurization. While ideal conditions demand a combination of both processes, the smaller towns will likely have to rely largely on but one.

As to the former method, nothing short of certified milk will yield a satisfactory degree of safety, and at times even this is the source of a false and dangerous sense of security. The overhead expenses necessary to produce and distribute certified milk are prohibitive for the small town. Not only is the expense beyond all reason for any except large dairies, but the health department would not be able to employ a dairy inspector and secure a bacteriological laboratory, both of which are absolute essentials. It is plain, therefore, that sanitary control of the milk supply can not meet the problems of the small town.

Pasteurization offers more hope. If a dairyman or milk concern handles as much as 300 or 400 quarts of milk per day, pasteurization of that milk will probably not add more than 2 or 3 cents per quart to the cost. The equipment necessary for efficient pasteurization of

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<sup>1</sup> Presented before the Southeastern Sanitary Association at Knoxville, Tenn., May 20-22, 1918. Dr. Miller has been able to make the experiment here reported in the course of a study of county health work in Edgecombe County, N. C., where he is serving in the capacity of acting health officer.

<sup>2</sup> In other words, the amount of milk consumed, not the population, indicates the milk problem of the town. For instance, it is understood that in northern towns milk consumption per capita per day is about 1 pint, whereas in the average town in the south it is very much less than that. A recent careful survey of the milk consumption of Tarboro, N. C., a town with a population of 5,500, was unable to account for more than about 400 quarts per day at the outside. On the basis of consumption for northern towns, it should be about 2,750 quarts, or six times what it actually is.

300 quarts of milk at a time may be had for about \$500. In case a central station for receiving, bottling, pasteurizing, and distributing the milk is desired, the entire expense for machinery and delivery facilities will be in the neighborhood of \$1,000.

It is obvious, however, that there is a limit in the size of the town below which the operation of any scheme for supplying safe milk becomes impracticable as a commercial proposition. As a result of practical investigation, the conclusion that a safe milk supply is possible for any town consuming 400 quarts of milk or more per day seems to be reasonable. In addition to the hundreds of small towns consuming this amount, there are perhaps as many others which could and should, as a result of propaganda leading to a consumption somewhat comparable to that considered normal for most northern towns and cities, be in a position to have their milk pasteurized economically.

In the case of these small towns consuming 300 or 400 quarts of milk per day, it will be found that three or more producers contribute to the supply, so that the output of no one of them is likely to be more than 100 quarts and that of some may be much less. Inasmuch as the calculations above are based on 300 quarts as the minimum which would enable a pasteurizing plant to operate economically, some provision must be made to relieve the producers of the pasteurizing process. A complete answer to this need is found in municipal pasteurization. This idea is not a new one at all, but the extension of it to the very small towns which can not get even reasonably safe milk by any other means is an entirely new departure, so far as the writer is aware. A practical experiment which will determine the workability of this scheme is now being inaugurated in Tarboro, N. C.

The milk supply of Tarboro does not exceed 400 quarts a day. There are no producers who make dairying anything but a side issue, and there is an annoying number of family cows, the surplus milk from which is dispensed among the neighbors. No part of the milk is produced under conditions above the ordinary from a sanitary point of view. Practically all of the work of operating the dairies is done by ordinary negro labor, virtually without any direct supervision. Nearly all of the milk is delivered in bottles, but some is delivered in bulk.

In order to meet these conditions and dispose of them effectually the following program is being developed.<sup>1</sup> A milk ordinance is to be passed by the town council<sup>2</sup> requiring all milk sold in Tarboro to be pasteurized. The pasteurization is to be done in a central plant owned and operated by the town. The cost of all machinery needed

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<sup>1</sup> The writer is indebted to Sanitary Engineer Albert F. Stevenson, of the U. S. Public Health Service, for many suggestions of assistance in developing this program.

<sup>2</sup> This ordinance in effect, October 1, 1918. It is given at the end of this article.

for this purpose has been found to be about \$800. The plant is to be installed in one section of the city light and power plant, thereby giving immediate access to an abundance of steam at all times for operating purposes.<sup>1</sup>

The town proposes to do not only the pasteurizing, but the collecting and distributing as well. In other words, the town is going into the milk business. The producers will deliver the milk to the pasteurizing plant and will receive cash for it either daily, weekly, or monthly, as they choose. In order to eliminate bookkeeping and to insure against loss in collection of accounts, the coupon system will be employed.<sup>2</sup>

A bottle pasteurizer will be used in this plant, for the following reasons: (1) Because it is cheaper to install than the bulk pasteurizer in the case of a plant such as the one contemplated; (2) because it avoids all chance of contamination following pasteurization; and (3) in order to enable any person who so desires to obtain the milk of his favorite dairyman.

The town will not aim to make money out of this undertaking, but to make it just self-supporting. The increase in cost due to pasteurization will be offset partly by the saving effected from the elimination of one delivery a day, partly by the abolition of overlapping milk routes, and partly by the elimination of loss in collections. But after these savings are effected some addition to the present cost of milk to the consumer will most likely be required.<sup>3</sup>

It is not intended to discard sanitary control measures. On the contrary, these can be regulated more effectually, because the town can simply refuse to buy milk not produced under reasonably clean conditions. It is quite possible for the health officer or a committee of business men to determine this fact by periodic inspection of dairy farms.

The solution of the milk problem for the small towns, therefore, will apparently be established in the future upon two principles: (1) Efficient pasteurization under municipal operation; and (2) a modified set of sanitary requirements for the farm, which will insure a reasonable degree of common cleanliness.

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NOTE.—This paper on Safe Milk for the Small Town was presented before the Southeastern Sanitary Association May 20–22, 1918. On October 1, 1918, the municipal pasteurization plant as described by Passed Asst. Surg. Miller was placed in operation.

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<sup>1</sup> It happens that the light and power plant adjoins the ice plant for the town, from which can be derived a supply of ice or brine for cooling and refrigeration.

<sup>2</sup> No milk will be delivered without collecting coupons which have previously been paid for.

<sup>3</sup> No milk is sold at the present time for more than 12 cents per quart, although Tarboro's closest neighbors, Rocky Mount and Wilson, are paying retail prices of 18 and 20 cents. A price of 15 cents per quart to the consumer in Tarboro, therefore, does not seem unreasonable. Tarboro proposes to pay the producers 10 cents per quart for milk delivered at the plant.

The success of the enterprise is indicated by the following extract from a letter from Dr. Miller dated November 15, 1918:

"The plant has been in operation since October 1, 1918. The forwarding of the manuscript has been delayed until the present date in order to have time enough to give the plant a fair test. I am pleased to say that it has fully justified every expectation, in spite of the fact that the supply is even much smaller than the calculations indicated. We are receiving only about 175 quarts of milk per day, which, of course, is the entire supply of the town. Even with this small amount, the plant has shown that it is not only self-supporting but yields a certain amount of revenue.

"The total cost thus far for everything has amounted to \$1,267. This includes all machinery, equipment, and the installation of the same, and likewise delivery facilities. There are certain other small bills outstanding, but these are insignificant.

"Milk is purchased from the producers at 12 cents per quart and delivered to the consumers at 17 cents per quart.

"Disheartening difficulties were met with the first week of the operation of the plant. The trouble was determined to be improper and insufficient cooling of the milk before and after pasteurization. These matters were speedily adjusted and perfect operation has been experienced ever since. Trouble was anticipated in the radical change from the old system to the new, but the satisfaction now with the system seems to be almost universal. The only source of anxiety at the present time is the scarcity of milk. This necessitates an equitable distribution so that all who want milk will get some, though their portion frequently has to be reduced. The few complaints that are met with are practically all due to the inability to furnish milk in the amount desired."

#### **An Ordinance to Provide for a Safe Milk Supply in Tarboro, N. C.**

SECTION 1. The terms "milk" and "cream" used in this ordinance, unless otherwise designated, shall be taken to mean fresh whole milk and sweet cream, respectively.

SEC. 2. After October 1, 1918, it shall be unlawful for any milk or cream to be sold for human consumption in the town of Tarboro which shall not have been previously pasteurized in accordance with the standards set forth in this ordinance.

SEC. 3. For the purpose of aiding in the requirements of this ordinance the town of Tarboro shall at once establish a municipal milk plant where milk may be sold by the producers, and where said milk shall be bottled, pasteurized, and thence distributed to consumers in the town of Tarboro.

SEC. 4. No milk may be sold in the town of Tarboro except by persons having a license for this purpose, which license shall have been obtained from the county health officer. Such license must be renewed yearly, and is subject to cancellation at any time in case of violation of any of the provisions of this ordinance by the licensee.

SEC. 5. The licensee shall furnish monthly on forms provided for this purpose a signed statement setting forth the fact that, so far as applicable to him or her, all the provisions of this ordinance have been faithfully complied with. Failure to supply such statement, or any reason to doubt the accuracy thereof, shall constitute sufficient cause for temporary or permanent suspension of the privileges of said license in accordance with the gravity of the case.

SEC. 6. No cow may be kept within the limits of the town of Tarboro without a permit from the sanitary inspector, which permit shall remain in force during the time said cow is in the possession of said owner, provided no cause shall have arisen to justify the revoking of said permit.

SEC. 7. The processes of production and handling of milk on the part of the producers must conform to the principles of common cleanliness throughout, and must be such that milk delivered at the pasteurizing plant shall be free from any gross evidence of filth.

SEC. 8. Immediately after milking the milk must be cooled to a temperature of 60° F. or lower, unless delivered at the plant within two hours from the time of milking.

SEC. 9. It shall be unlawful either to add to or subtract from milk or cream any substance which would alter the chemical or bacteriological character of said milk when offered as such for sale or barter in the town of Tarboro.

SEC. 10. It shall be unlawful to offer for sale or barter in the town of Tarboro any milk or milk products derived from any cow known or suspected to be suffering from any diseased or unhealthy condition, or from any cow before seven days after calving.

SEC. 11. No milk or cream which shows any signs whatsoever of deterioration shall be marketable for human consumption in the town of Tarboro: *Provided*, Nothing in this section shall be construed to prohibit the sale of the following milk products: Skim milk, sour milk, sour cream, buttermilk, whey, and clabber. In each case these products must undergo pasteurization as prescribed for sweet milk and cream, and when delivered the container must bear a label stating the contents thereof.

SEC. 12. The price of milk delivered to the pasteurizing plant shall be determined by the town council. Also, the price of milk delivered by the plant to the consumer shall be determined by said town council.

SEC. 13. Upon receipt of milk at the pasteurizing plant it shall be immediately transferred to bottles whose interior is clean and sterile.

SEC. 14. All milk having been bottled as in section 13 shall be pasteurized in the bottle by raising the temperature of the milk to 145° F., and holding it at or near this point for 30 minutes, after which time it shall be immediately cooled down to 55° F., and held at or near this point until delivery.

SEC. 15. The sanitary management of the pasteurizing plant, and the process of pasteurization shall be under the supervision and control of the county health officer.

SEC. 16. The floors and walls of the pasteurizing plant and the machinery and utensils used in the plant shall be kept at all times in a condition of cleanliness. The plant and the operation of the same shall be at all times open to inspection by the citizens of Tarboro.

SEC. 17. A temperature record shall be made throughout each pasteurization, by means of a chart placed upon the dial of a recording thermometer. These charts shall be dated, certified as to their correctness, and submitted to the county health officer daily. They shall then be preserved as permanent records by the county health officer.

SEC. 18. One delivery daily shall be made, which shall endeavor to reach each customer at or near the same hour of each day.

SEC. 19. No milk will be delivered except in return for coupons which shall have been previously purchased for this purpose.

SEC. 20. Customers shall be held responsible for bottles in their possession, and for the loss of same by breakage or otherwise shall be required to reimburse the town at the current price for such bottles.

SEC. 21. Bottles left by the deliveryman on any certain day shall be properly washed and returned to the deliveryman within two days.

SEC. 22. The town of Tarboro reserves the right to refuse to buy any milk not produced and handled in accordance with the rules prescribed herein for the production and handling of milk. The town of Tarboro likewise reserves the right to refuse to sell milk except to customers who conform to the rules herein prescribed for milk consumers.

SEC. 23. Violation of any of the provisions of this ordinance shall constitute a misdemeanor, and a fine of \$5 shall be imposed upon any person found guilty of such violation.